

Preparation of spicy flavoured *Paneer* blended with cumin and black pepper powder

Roshani R. Gole, R. R. Shelke, V. S. Kale and R.D. Dhage

The present investigation on preparation of spicy flavoured *Paneer* blended with cumin and black pepper powder was undertaken in Department of Animal Husbandry and Dairy Science, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola with main objective to find out acceptable level of spices by sensory evaluation, physico-chemical properties and to work out the production cost. The *Paneer* was prepared from buffalo milk with addition of cumin, black pepper powder and their combination as T₁ (control- plain *Paneer*), T₂ (*Paneer* blended with 0.2% cumin powder), T₃ (*Paneer* blended with 0.4% cumin powder), T₄ (*Paneer* blended with 0.2% black pepper powder), T₅ (*Paneer* blended with 0.4% black pepper powder) and their combination as T₆ (*Paneer* blended with 0.2% cumin and 0.2% black pepper powder) and in T₇ (*Paneer* blended with 0.4% cumin and 0.4% black pepper powder). Cumin and black pepper powder with 0.2 to 0.4 per cent level individually and in combination were significantly affect the moisture, ash content of *Paneer*. Protein, fat and total solid content increased significantly as cumin and black pepper powder proportion increased individually and in their combination. The overall acceptability of *Paneer* prepared from buffalo milk was acceptable in all respect but with addition of cumin and black pepper powder in their combinations in proportion of 0.4 per cent (T₇) each has good quality and acceptability. 0.4 per cent black pepper powder (T₅) and 0.4 per cent cumin powder (T₄) were also acceptable in quality and for value addition also. Regarding cost of production of *Paneer* it was observed that the cost of production increased considerably due to blending of cumin and black pepper powder but which can be compensated with flavour and acceptability of product as ready to eat spicy *Paneer* as a snacks also.

Key Words : Buffalo milk, *Paneer*, Cumin, Black pepper, Sensory evaluation, Chemical composition, Cost of production

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INTRODUCTION

Paneer is an important nutritious and wholesome indigenous dairy product, which occupy a prominent place among traditional milk products and carry lot of market

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potential. It is non-fermentative, non-ripened, non-melting and unripened type of cheese. It is an estimated that about 5 per cent of milk produced in India is converted to *Paneer* (ICMR, 2000 and Chandan, 2007). *Paneer* is a South Asian variety of soft cheese prepared by acid and heat coagulation of milk. According to the PFA (2010). The ability of *Paneer* to be deep fried is one feature that has led to its wider acceptance and a favorite for making snacks, pakoras or fried *Paneer* chunks (Aneja, 2007). Cumin and black pepper have various effects when used in foods. Not only they impart-flavour, pungency and colour characteristics; they also have anti-oxidant, anti-

microbial, pharmaceutical and nutritional properties. The seeds of the plant are used to add flavour to spicy dishes. They are also used as an appetite stimulant and to ease stomach disorders (Oraon *et al.*, 2017).

This indicates that there is tremendous opportunities for manufacturing and marketing of *Paneer*. The development of flavoured *Paneer* would further enhance the production of *Paneer*, as it caters the needs of health loving consumers. Use of cumin and black pepper in *Paneer* give good taste and can be utilized as snacks by deep fried.

METHODOLOGY

Fresh, clean whole buffalo milk was procured from Livestock Instructional Farm of Department of Animal Husbandry and Dairy Science, Dr. PDKV, Akola and utilized for preparation of flavoured *Paneer*. Good quality cumin and black pepper was purchased from local market of Akola city. Both was graded in mixer and use for experiment purpose. *Paneer* was prepared as per the procedure standardized by Aneja *et al.* (2002) with slight modifications. The *Paneer* was prepared from buffalo milk with addition of cumin, black pepper powder and their combination as T₁ (control- plain *Paneer*), T₂ (*Paneer* blended with 0.2% cumin powder), T₃ (*Paneer* blended with 0.4% cumin powder), T₄ (*Paneer* blended with 0.2% black pepper powder), T₅ (*Paneer* blended with 0.4% black pepper powder) and there combination as T₆ (*Paneer* blended with 0.2% cumin and 0.2% black pepper powder) and in T₇ (*Paneer* blended with 0.4% cumin and 0.4% black pepper powder). Observations from total 07 treatments and 04 replications were recorded in the present investigation.

Sensory evaluation of *Paneer*:

The product was evaluated for flavour, colour, appearance, body and texture, taste and finally overall acceptability was carried out by using 100 point numeric

score as described by Pal and Gupta (1985).

Chemical analysis of *Paneer*:

The total solids content was determined by gravimetric method as per IS:1479 (Part II), 1961. The fat content was determined by using standard Gerber method as described in IS:1224 (Part I), 1977. The protein content was determined by estimating the per cent nitrogen by microkjeldhal method as recommended in IS:1479 (Part II), 1961. The per cent nitrogen was multiplied by 6.38 to find out the protein percentage in *Paneer*. The acidity of *Paneer* expressed as per cent lactic acid was determined by the method described in IS:1479 (Part I), 1960. Ash content of *Paneer* was determined as per the method described in A.O.A.C. (1975).

Cost of production:

The production cost of *Paneer* was worked out by using prevailing market rates of ingredients only.

Statistical analysis :

The data was tabulated and analyzed by employing Completely Randomized Design (CRD) using seven treatments with four replications as prescribed by Sheoran *et al.* (1998).

OBSERVATIONS AND ASSESSMENT

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Chemical composition of basic ingredients:

Average chemical composition of Table 1 buffalo milk, cumin and black pepper were presented in Table 1.

Sensory evaluation of *Paneer*:

The sample of *Paneer* as per treatments were judged

Sr. No.	Constituents	Buffalo milk	Cumin	Black pepper
1.	Total solids	15.45	96	88
2.	Moisture	84.55	4	12
3.	Fat	6.44	22	10.2
4.	Protein	3.82	18	10.0
5.	Ash	0.83	8	4.6
6.	Acidity	0.141	0.58	0.42

by panel of judges for flavour, colour and appearance, body and texture and taste by 100 point numerical scale and the observations recorded were tabulated and presented in Table 2.

Colour and appearance of *Paneer* :

It is observed from Table 2, that *Paneer* prepared from buffalo milk and mixing with different spices and their combinations in treatment T₇ was found like very much. The average score for colour and appearance of different *Paneer* were 16.50, 17.00, 18.00, 17.25, 18.25, 17.50 and 18.50 for treatment T₁, T₂, T₃, T₄, T₅, T₆ and T₇, respectively. The result indicated that significant effect of proportion of spices with buffalo milk on colour and appearance of *Paneer*. While treatment T₇ was at par with treatment T₆, T₅ and T₃. The obtained results was in close agreement with Omer (2014) that colour and appearance score of soft white cheese increased with addition of cumin oil. Buch *et al.* (2014) reported that the score for colour and appearance of *Paneer* increased with addition of turmeric. Himabindu and Arunkumar (2017) who reported that the score for colour and appearance cottage cheese blended with spice was increased with addition black pepper.

Flavour of *Paneer*:

It was observed from above findings that the mixing of buffalo milk with different spices and their combinations in various proportions was produce good quality *Paneer* to increased upto 0.4 per cent of spices mixing with buffalo milk. This might be due to pleasant flavour of spices and acceptability of *Paneer* in T₇ treatment. The obtained results was in close agreement

with Omer (2014) that flavour score of soft white cheese increased with addition of cumin oil. Khatkar *et al.* (2017) suggested that flavour score of *Paneer* increased with addition of cinnamon spice. Himabindu and Arunkumar (2017) indicating that score for flavour of cottage cheese blended with spice was increased with addition of black pepper.

Body and texture of *Paneer*:

The body and texture of *Paneer* in treatment T₇, T₅ and T₃ was significantly superior over T₆, T₄, T₂ and T₁. Treatment T₇ was at par with T₅ and T₃. It showed that mixing of buffalo milk with different spices in combinations and individually in T₇ was found like very much. The result observed in above investigaton for body and texture is more or less similar to result showed by Khatkar *et al.* (2017) that body and texture of *Paneer* increased with addition of cinnamon spice. Himabindu and Arunkumar (2017) who suggested score for body and texture of cottage cheese blended with spice was increased with addition of blackpepper.

Overall acceptability of *Paneer*:

The treatment T₇, T₅ and T₃ was significantly superior over the T₆, T₃, T₂ and T₁ treatments. The treatment T₇ is at par with T₅ and T₃ treatment. The overall acceptability depends upon the score at flavour, body and texture and appearance, all these attributes increased in treatment T₇, T₅ and T₃. The above results was in agreement with results showed by Anju Khatkar *et al.* (2017) that the score for overall acceptability of *Paneer* increased with the addition of cinnamon spice. Himabindu and Arunkumar (2017) who reported that the score for

Table 2: Sensory evaluation of spicy flavoured *Paneer* blended with cumin and black pepper powder

Treatments	Mean values of scores obtained for five replications (Score/Marks)			
	Colour and appearance (20)	Flavour (45)	Body and texture (35)	Overall acceptability (100)
T ₁	16.50	35.75	30.00	82.75
T ₂	17.00	36.25	30.50	85.00
T ₃	18.00	42.75	32.00	92.75
T ₄	17.25	37.00	30.75	85.25
T ₅	18.25	43.00	32.75	94.00
T ₆	17.50	38.50	31.75	85.50
T ₇	18.50	43.25	33.50	95.25
'F' test	Sig	Sig	Sig	Sig
S.E.±	0.354	1.819	0.440	2.070
C.D. (P=0.05)	1.047	5.386	1.302	6.129

overall acceptability of cottage cheese blended with spices was increased with addition of black pepper.

Chemical composition of spicy panner blended with cumin and black pepper:

Treatment wise samples of spicy panner blended with cumin and black pepper was subjected to chemical analysis for fat, protein, total solids, ash and titratable acidity. The results obtained were tabulated and presented in Table 3.

Fat content in Paneer:

The perusal of data from Table 3 revealed that addition of different spices and their combinations had significantly affect the fat content of *Paneer*. The declining trend of fat content of *Paneer* can be attributed to the fact that the fat content of cumin is little higher (22 %) than blackpepper (10.2%), both values are much lower than that plain *Paneer* (25.00%). This results was in agreement with result reported by Mishra (2013) that with addition of different spices fat content of *Paneer* decreased. Mhatre (2018) reported that fat content of *Paneer* decreased with addition of ginger juice.

Protein content in Paneer:

The data indicates that, as proportion of cumin spice with buffalo milk increased, the protein content of *Paneer* also increased as cumin contain 18.00 per cent protein. While black pepper spice proportion showed declining trend on protein content of *Paneer* as it contain 10.00 per cent protein. The treatment T₃ was significantly superior over rest of the treatments. The treatment T₃ is

at par with T₂ and T₁. These results were in agreement with the results reported by Rani *et al.* (2014) stated that protein content of *Paneer* increased with the addition of different spices with milk. Mishra (2013) that with addition of different spices protein content of *Paneer* increased with addition of different spices. Omer (2014) reported that protein content of soft white cheese increased with the addition of cumin oil. Badola *et al.* (2018) observed that the protein content of *Paneer* is slightly decreased with the addition of black pepper and cardamom.

Total solids content of Paneer:

The effect of proportion of blending of buffalo milk with different spices and their combinations on total solid content in *Paneer* was observed significant effect. Treatment T₇ was significant superior over other treatments. Result observed in present investigation was in agreement with result reported by Omer (2014) that as addition of cumin oil in Sudanese white cheese during ripening increased the total solids content of the product. Rani *et al.* (2014) reported that with the addition of different spices total solids content of *Paneer* decreased.

Ash content of Paneer:

It was observed that the ash content show gradual increase with increase in the level of different spices and their combinations. The increasing trend of ash per cent in *Paneer* was more in cumin (8%) as compare to black pepper (4.6%). While ash content in *Paneer* (1.71%). These results was in agreement with the results obtained by Rani *et al.* (2014) stated that ash content of *Paneer* increased with addition of different spices. Omer (2014)

Table 3: Chemical composition of spicy flavoured Paneer blended with cumin and black pepper powder

Treatments	Mean values of five replications in per cent				
	Fat	Protein	Total Solids	Ash	Acidity
T ₁	25.000	16.240	48.51	1.710	0.500
T ₂	24.993	16.243	48.60	1.723	0.498
T ₃	24.988	16.245	48.71	1.735	0.495
T ₄	24.970	16.208	48.58	1.715	0.495
T ₅	24.940	16.215	48.66	1.723	0.493
T ₆	24.963	16.230	48.68	1.828	0.498
T ₇	24.928	16.223	48.85	1.745	0.495
'F' test	Sig	Sig	Sig	Sig	NS
S.E.±	0.004	0.003	0.003	0.003	0.003
C.D. (P=0.05)	0.012	0.010	0.008	0.009	--

NS= Non-significant

that as addition of cumin oil in Sudanese white cheese during ripening increased the ash content of the product. Mhatre (2018) showed that ash content of panner increased with addition of ginger juice in *Paneer*.

Titrateable acidity of *Paneer*:

It is revealed from table that, average acidity was 0.500 per cent in buffalo milk *Paneer* (T₁) while acidity content in blended *Paneer* were 0.498, 0.495, 0.495, 0.493, 0.498 and 0.495 per cent in treatments T₂, T₃, T₄, T₅, T₆ and T₇, respectively. Treatment T₅ (0.493 %) showed lowest acidity than T₁, T₂, T₃, T₄, T₆ and T₇ treatments. The result observed in present investigation on titrateable acidity was in close agreement with reported by Buch *et al.* (2014) that decrease in titrateable acidity of *Paneer* with increase in level of turmeric. Himabindu and Arun Kumar (2017) who suggested that there is slightly decrease in titrateable acidity of cottage cheese blended with spice was increased with addition of black pepper. Mhatre (2018) who stated that there is slightly decreased in titrateable acidity with the addition of ginger juice in *Paneer*.

Cost of production of spicy panner blended with cumin and black pepper:

While estimating the cost of the finished product, the cost of the ingredients used for preparation of *Paneer* was rated as per the prevailing market price. In addition to fuel cost, miscellaneous cost and the labour charges @ 10 per cent of the total cost of production were also taken into consideration. The cost of production of *Paneer* from buffalo milk blended with different spices and their combinations for treatment T₁, T₂, T₃, T₄, T₅, T₆ and T₇ were Rs. 260.075, 260.675, 261.275, 262.275, 264.475, 262.875 and 2645.675, respectively. Overall change in cost of production was non-significant these may be due to use of very small quantity of cumin and black pepper in *Paneer*. These slight increases in rate of *Paneer* can be compensated with value addition in tasted flavour and aggregate value of spices. These observations were supported by some research workers as, Mhatre (2018) calculated that incorporation of ginger juice in *Paneer* manufacturing resulted in considerable increase in the cost of production comparable to control *Paneer*. Desale (2012) concluded that the cost of production of *Paneer* with addition of different preservatives *viz.*, black pepper, cardamom, clove, black pepper + clove, black pepper + cardamom and clove + cardamom to enhance shelf-life

of *Paneer* is slightly increased per kg of *Paneer*.

Conclusion:

On the basis of data obtained in the present investigation it is concluded that, highest overall acceptability score was obtained from buffalo milk *Paneer* however, the panel of judges also accepted for T₇ followed by T₅ and T₃ treatments. Chemical analysis of *Paneer* showed that, protein, total solids and ash in *Paneer* increased while fat content was decreased with increased level of cumin, black pepper powder and their combinations. The cost of *Paneer* was slightly increased *i.e.* Rs. 260.075 (T₁) to 265.675 (T₇) by blending of cumin, black pepper powder and their combinations in different proportion for preparation of *Paneer* which can be compensated with the flavour of the product.

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